

brightness of the northern nights. The perspicuity with which the yearly course of the period is drawn in the four representations of Fig. 1 may even be called surprising, considering the material of observation only embraces three years.

Fig. 1.

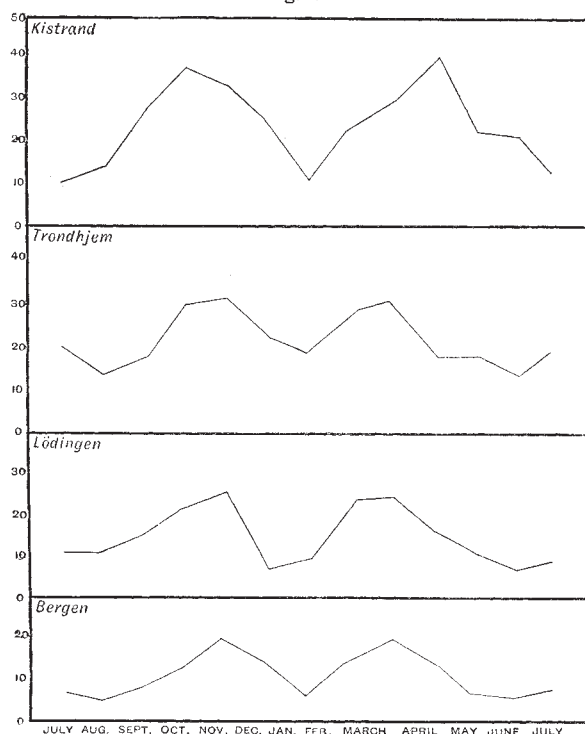


TABLE III.—Lödingen

Month	1881 to 1882	1882 to 1883	1883 to 1884	Total
July ...	3	4	3	10
August ...	6	3	1	10
September ...	9	3	3	14
October ...	8	11	1	20
November ...	8	14	4	26
December ...	2	5	0	7
January ...	5	4	0	9
February ...	10	10	3	23
March ...	9	9	6	24
April ...	10	4	3	17
May ...	7	3	2	12
June ...	2	6	0	8

Year ... 79 ... 75 ... 26 ... 180

TABLE IV.—Bergen

Month	1881 to 1882	1882 to 1883	1883 to 1884	Total
July ...	2	1	3	6
August ...	0	3	2	5
September ...	5	1	1	7
October ...	5	3	4	12
November ...	6	10	3	19
December ...	6	6	1	13
January ...	3	1	2	6
February ...	3	9	0	12
March ...	10	4	4	18
April ...	9	3	1	13
May ...	4	2	0	6
June ...	3	1	0	4

Year ... 56 ... 44 ... 21 ... 121

Tables I. to IV. will show the great frequency of these telegraphic perturbations in Norway compared with those of all other countries in Europe. In the totals of the years a constant decrease for all four stations is visible which decidedly coincides

with the diminishing appearance of the aurora during recent years in this country. After some years it will probably be seen how the telegraphic perturbations have the 11-year period in common with the aurora.

In order to determine the daily period, I have investigated how often during the three years in every hour from 7 a.m. till midnight perturbations have been observed (excluding those caused by thunderstorms). Table V. shows the result:—

TABLE V.

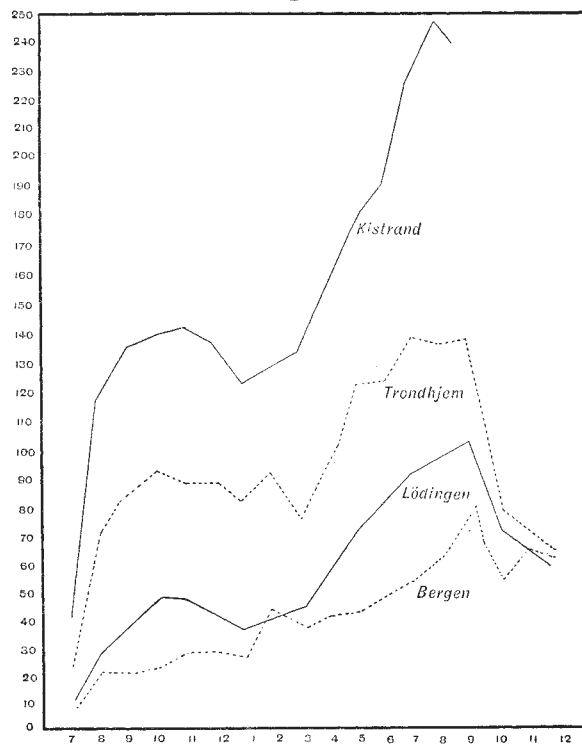
	7	8	9	10	11	12
Kistrand ...	42	117	135	139	141	137
Trondhjem ...	24	61	84	91	88	88
Lödingen ...	11	30	39	48	47	41
Bergen ...	9	23	23	24	28	29

	1	2	3	4	5	6
Kistrand ...	122	128	133	155	177	191
Trondhjem ...	81	91	75	93	120	123
Lödingen ...	36	41	43	57	70	80
Bergen ...	27	43	37	40	42	47

	7	8	9	10	11	12
Kistrand ...	227	247	238	—	—	—
Trondhjem ...	137	136	138	77	69	61
Lödingen ...	91	96	100	70	61	54
Bergen ...	52	61	77	51	61	59

Fig. 2 gives these numbers in graphic representation. It will

Fig. 2.



be seen that the telegraphic perturbations show a very prominent maximum in the evening, 8 till 9 o'clock. Intimations of a trifling maximum (with the exception of Bergen) 10 till 11 a.m., and a succeeding minimum 1 to 2 p.m. are also visible.

Other occupation taking up my time at present a more extensive and detailed investigation must be postponed.

Christiania

SOPHUS TROMHOLT

A NOTE RELATING TO THE HISTORY OF THE AURORA BOREALIS

AMONG northern authors none has given the writers on the Aurora Borealis more to trouble than Peder Claussøn Friis, 1566-1614, Minister at Undal, near the town of Mandal, in Southern Norway. This, for his time, very productive

author, wrote, towards the end of the sixteenth century, a treatise, "About Greenland." In a second edition (about 1600) he added some extracts from the "Kings-mirror,"¹ and among these, one about the Aurora Borealis. But here he has inserted a remark, which in a high degree has attracted attention and caused astonishment, and which, till now, has been inexplicable to the investigators of the Aurora Borealis. I give further on a translation of the description of the Aurora Borealis in the "Kings-mirror," and after it the version of Peder Claussön :—

Kings-mirror

"Such a nature and condition has the north-light, that the more obscure the night, the more brilliant it appears, and only in the night is it to be seen, never during the daytime, and especially in profound darkness, but seldom by moonlight. It appears as a large flame from a heavy fire seen from afar. Out of this flame protrudes, apparently up in the air, sharp points of unequal height, and very unsteady, so that now one, then the other is higher, and in such a manner this light is pendent like a luminous blaze. As long as these flashes are most intense and bright, such a keen light radiates from these streams of fire and rays, that outdoor people can find their way, and even go a hunting, if it should be necessary. Also, when people are in houses provided with windows, it is so bright inside that all present can recognise each other. But this light is so fluctuating that it sometimes seems to darken, as if a black smoke or a heavy nebulous cloud had been puffed into it, and then shortly again it seems as if the light were about to be smothered in this smoke, and almost become quite extinct. But as soon as this fog commences to dissolve, then this light brightens, and clears up for the second time, and it happens even that one would believe that heavy sparks emitted from it as from a red-hot iron just taken out of the forge. When the night declines, and with day-break this light begins to decrease, and when the day has set in it seems entirely to disappear."

Peder Claussön Friis

"In Greenland a meteor and bright light is seen on the sky during the night, which appears in the following manner: the more obscure the night the more brilliant is the light; that is to say, the less the moon shines, and when she is in her prime or wane, the more this light becomes visible in the sky, however, always towards the north, AND NEVER SO HIGH IN THE SKY AS TO BE OBSERVED IN OTHER COUNTRIES THAN GREENLAND, ICELAND, AND THE NORTHERN PART OF NORWAY, and for that reason it is called North-light."

"It appears as a flame or a darting fire, and extends over the sky like a tall and slender hedge, and it rushes up and down in a trice as if many organ pipes were posted one beside the other, and in the twinkling of an eye one shoots up and the other down, and where the flame darts clearest up and down, back and forwards, it can grow dim and almost leave behind it a smoke; but the next moment light up again on another spot, or catch fire where it just before seemed to be extinguished. Nobody who has not himself seen it, can imagine how quickly this light moves forwards and backwards, as if it were hopping and dancing with much agitation. And when this light is most intense, people can perceive everything in the houses as if the moon were shining. At daybreak this northlight fades away."

The "Kings-mirror" was written about 1250, at all events before 1260, and probably later than 1240. The home of the unknown, but at all events Norwegian, author may be looked for, according to the sagacious reasoning of H. Geelmuyden (Christiania Observatory) between 64° 23' and 64° 58' N. lat. (not far from the town of Namsos). This description of the aurora is indeed unparalleled in the aurora literature of the past ages; the noble but unvarnished manner in which he describes the phenomenon has not a counterpart in the same or at a much later period. It is peculiar, however, that the aurora is mentioned in the "Kings-mirror" as a phenomenon chiefly characteristic of Greenland, and not even an intimation is given as to its being visible in Norway. This description indicates, nevertheless, quite plainly that it is based on the author's own observation of the aurora in his native country, and it is there-

fore beyond doubt that he was familiar with the phenomenon,¹ although he has considered Greenland—the country situated, according to the opinion of past ages, farthest towards the north—the proper home of the aurora.

In Peder Claussön's above quoted version of the aurora description in the "Kings-mirror" I have made the remarks and expressions differing from the "Kings-mirror" conspicuous by italics. It will be seen that his citation is rather free; many of these conspicuous expressions, if not all, point to Peder Claussön's knowledge of the aurora through his own observation. The more striking is the conspicuous remark that the aurora in Greenland does not appear so high in the sky as to be observed in other countries than Greenland, Iceland, and the northern part of Norway.

This remark has been inserted in many other publications, and all historians of the aurora from Mairan to Fritz have occupied themselves with the notable circumstance that, according to this remark, the aurora was not visible during the last half of the sixteenth century in Southern Norway. But nowhere in the whole history of the aurora is it so evident how much caution must be displayed in drawing comprehensive inferences from a single remark of an old author.

Peder Claussön has, in a single copy of his treatise on Greenland in the year 1604 or 1605, with regard to the aurora, added the following important "note," hitherto unknown to the investigators of the aurora :—

"This northlight was, as before said, only seen in past times in northern countries. But in the period of my infancy, about the year 1550, it was first seen by people who live in the southern part of Norway, however not higher on the sky than the Polar Star. But since the year 1570 it ascends to such a height that it appears to us in the south-east and in a southern direction, and I suppose that it is seen at present also in other countries."

Peder Claussön's relation is thus in downright contradiction with the interpretation given to his above-mentioned remark. It remains now to explain how he could write, in the year 1600, that the aurora was only visible in the extreme north of Norway. It may be seen that he had the opinion that the aurora, in "past times," was only visible in "the northern countries"; the silence of the "Kings-mirror" about this phenomenon in Norway has perhaps brought him to this conclusion. The remark "and never so high in the sky as to be observed," &c., therefore, in all probability describes the circumstances which, after his opinion, took place at the time when the "Kings-mirror" was written. The additional clause, "and for that reason it is called northlight," seems at the same time to intimate that he, by the previous remark, would explain why the author of the "Kings-mirror" uses the expression northlight (namely, because it is visible only in the extreme northern countries).

SOPHUS TROMHOLT

Christiania

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—Two studentships have been established at St. John's College on the foundation of the Rev. Mr. Hutchinson, late Senior Fellow. They are of the value of 60*l.* a year for two years and are tenable with a Foundation Scholarship. Any student of the College who shall be *bonâ fide* engaged in the pursuit of some branch or branches of physical or natural science or in the study of Semitic or Indian languages, and shall be of not less than nine and not more than eighteen terms' standing from the commencement of his residence in the University shall be qualified to be a candidate, and if there is no candidate belonging to the College of sufficient merit in these studies, the Council may elect a student engaged in any study, whether a member of the College or not. The Council may impose such conditions on the students as shall encourage genuine study after the best methods—*e.g.* they may require him to present in writing an account of his studies, to deliver lectures, &c. The election will take place in June each year.

It will be seen that a Hutchinson student may be free to work at biology in Naples, to join an Eclipse Expedition, to study Pali in Ceylon or Hebrew in Cambridge. We hope to hear of the Hutchinson students in the future.

The Senate has approved of the erection of a new Chemical

¹ The author himself never visited Greenland.

¹ The Kings-mirror (Konungs skuggsjá) is, of its kind, an unparalleled Norwegian work, in which an ingenious and noble man, who must have stood at the height of culture at his time, has expounded his philosophy and especially his views on State administration and ethics, in the form of conversations between a father and son. It is a book on good manners, social intercourse of the highest interest, because of the whole form of culture which it represents, and is written in elevated tone.